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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|-----------------------------|------------------|
| 09/774,534 | 01/31/2001 | Bing Chiang | 2479.2028-000 (TAN00-18) | 3250 |

21005 7590 04/22/2003

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EXAMINER

GLENN, KIMBERLY E

ART UNIT

PAPER NUMBER

2817

DATE MAILED: 04/22/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Applicati n No.

09/774,534

Applicant(s)

CHIANG ET AL.

Examiner

Kimberly E Glenn

Art Unit

2817

-- The MAILING DATE of this communication appears on the cover sheet with the correspondenc address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 February 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-34 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 4,5,19,31 and 33 is/are allowed.
- 6) ☒ Claim(s) 1-3,6-9,12,13,15-18,21-23,26,29,30 and 32 is/are rejected.
- 7) ☒ Claim(s) 10 11 14 20 24 25 27 28 34 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-3, 6-9, 12, 13, 15-18, 21-23, 26, 29, 30 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Arevalo US Patent 6,104,986.

Arevalo disclose a input port (port 1) coupled to receive a input signal; an output port (port 2) coupled to provide the an output signal, the output port coupled to the input port, such coupling between the input port and the output port having a characteristic input/output impedance; a first quadrature port (port 3) and a second quadrature port (port 4), the quadrature port coupled to one another, such coupling between quadrature ports having a characteristic quadrature port impedance; a first impedance transformer (112) coupled between the input port (port 1) and the a first one of the quadrature ports (port 3); and a second impedance transformer

Art Unit: 2817

108 coupled between the a second one of the quadrature ports(port 4) and the output port (port 2). (Claim 1) A branch line provides the coupling between the input port and the output port. (Claim 2) A branch line provides the coupling between quadrature ports. (Claim 3) The first and second impedance transformers are implemented as one-quarter-wavelength section of transmission line. (Claims 6 and 7) A varactor diode is connected to each of the quadrature ports. (claims 8 and 9) Arevalo disclose that the microstrip elements (108 110 112 114) have widths that correspond to the desired impedance of each leg. The four legs need not have the same width. The method steps to the above apparatus are inherent. (See figure 1 and column 2 line 43 through column 3 line 57 a)

Arevalo is shown to teach all the limitations of the claims with the exceptions of:

- (1) the characteristic input/output impedance being different from the characteristic quadrature port impedance.
- (2) the first impedance transformer transforming the characteristic input/output impedance across the input port and output port to the characteristic quadrature port impedance across the quadrature ports.
- (3) the second impedance transformer transforming the characteristic quadrature impedance across the quadrature ports to the characteristic input/output impedance.
- (4) the characteristic input/output impedance is 50 ohms.
- (5) the characteristic quadrature port impedance is 20 ohms.
- (6) the characteristic quadrature port impedance is lower than the characteristic input/output port impedance.

One skilled in the art at the time the invention was made would have found it obvious to optimizes the impedance match between the input and output ports as well quadrature ports. Therefore the characteristics input/output impedance and the characteristic quadrature impedance are not the same.

One skilled in the art at the time the invention was made would have found it obvious to have the first impedance transformer transform the characteristic input/output impedance to the characteristic quadrature port impedance in order to optimizes the impedance match between the input and output ports and the quadrature ports.

One skilled in the art at the time the invention was made would have found it obvious to have the second impedance transformer transform the characteristic quadrature ports impedance to the characteristic input output impedance in order to optimizes the impedance match between the input and output ports and the quadrature ports.

One skilled in the art at the time the invention was made would have found it obvious to the have characteristic input/output port impedance be 50 ohms, since it has been held that discovering an optimum value of a variable involves only routine skill the art.

One skilled in the art at the time the invention was made would have found it obvious to the have characteristic quadrature impedance be 20 ohms, since it has been held that discovering an optimum value of a variable involves only routine skill the art.

Response to Arguments

Applicant's arguments filed 2/6/03 have been fully considered but they are not persuasive. Applicant argues that it would not be obvious to have the characteristic impedance

Art Unit: 2817

between the quadrature ports be different than the impedance between the input/output ports.

Arevalo discloses in column 2 line 65 through column 3 line 8:

“The microstrip elements 108, 110, 112, 114 of the 3 dB hybrid structure has widths that correspond to the desired impedance of each leg, and have lengths that correspond to 1/4 of the wavelength of the primary frequency of the input signal. Note that in practice the microstrip elements 108, 110, 112, 114 would be one continuous microstrip element, although the four legs need not have the same widths and lengths. The use of microstrip allows for ease in manufacturing because microstrips and stripline structures are photographically repeatable printed circuit board artwork, and their basic response is determined by their dimensions. Other types of transmission lines besides microstrip may also be employed.”

Arevalo states that the width of the microstrip elements correspond to the desired impedance of each leg and that the four legs need not have the widths, therefore the impedance, be the same. Therefore, examiner maintains that one skilled in the art at the time the invention was made would have found it obvious to optimize the impedance match between the input and output ports as well quadrature ports. Therefore the characteristics input/output impedance and the characteristic quadrature impedance are not the same.

Allowable Subject Matter

Claims 4, 5, 19, 31 and 33 are allowed.

Claims 10, 11, 14, 20, 24, 25, 27, 28, and 34 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

With regards to claims 4, 5, 19 and 20, the prior art of record does not disclose or fairly teach the coupling between the input port and the output port (or quadrature ports) being provided by coupling lines. With regards to claims 10, 24, 27 and 33, the prior art of record does not disclose or fairly teach an input bias voltage being applied to the a varactor diode. With regard to claims

14 and 31, the prior art of record does not disclose or fairly teach a radio frequency choke being applied between a bias voltage port and one of the quadrature ports.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kimberly E Glenn whose telephone number is (703) 306-5942. The examiner can normally be reached on Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Pascal can be reached on (703) 308-4909. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7724 for regular communications and (703) 308-7724 for After Final communications.

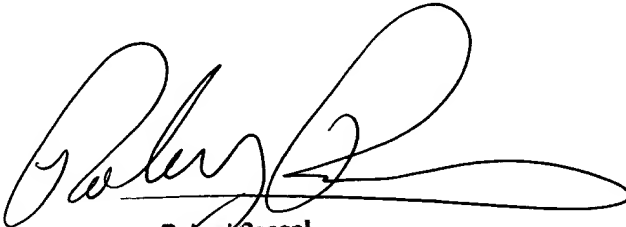
Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

Application/Control Number: 09/774,534
Art Unit: 2817

Page 7

Kimberly E Glenn
Examiner
Art Unit 2817

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April 18, 2003



Robert Pascal
Supervisory Patent Examiner
Technology Center 2817